



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
-----------------	-------------	----------------------	---------------------	------------------

10/709,783

05/27/2004

Mohammed Moin Hussaini

146128CT

3782

23413 7590 10/10/2008
CANTOR COLBURN, LLP
20 Church Street
22nd Floor
Hartford, CT 06103

EXAMINER

MEHTA, PARIKHA SOLANKI

ART UNIT

PAPER NUMBER

3737

NOTIFICATION DATE

DELIVERY MODE

10/10/2008

ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

usptopatentmail@cantorcolburn.com

Office Action Summary	Application No. 10/709,783	Applicant(s) HUSSAINI ET AL.	
	Examiner PARIKHA S. MEHTA	Art Unit 3737	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 09 September 2008.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,2,4-12,14-17 and 19-24 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,2,4-12,14-17 and 19-24 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 9 September 2008 has been entered.

Claim Objections

2. Claim 11 is objected to because of the following informalities: claim 11 fails to positively recite any structural limitations for the inventive system, and as such the intended scope of this claim is unclear. Claim 11 recites nothing more than language directed towards the intended use of the system, and as such does not further limit the structure of the claimed invention. Appropriate correction is required.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Art Unit: 3737

5. Claims 1, 2, 4, 5, 16, 17 and 19-24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Susil (WO 02/22015), hereinafter Susil ('015), previously made of record, in view of Wang et al (US Patent No. 5,657,429), hereinafter Wang ('429), further in view of Onik (US Patent No. 4,583,538), hereinafter Onik ('538), previously of record.

Regarding claims 1, 2, 4, 5, 21 and 24, Susil ('015) teaches a method and system for guiding an end effector to a target position, wherein the end effector is spatially associated with a robot coordinate system (Abstract, p. 7 lines 24-27), including steps for generating a plurality of CT images, indicating a skin entry position, indicating a target position, determining a trajectory path, registering the robot and image coordinate spaces using a fiducial component associated with the end effector, and moving the end effector along the trajectory path (Figs. 1 & 2, p. 4 lines 14-19 & 24-25, p. 5 lines 7-8 & 21-25, p. 6 lines 17-18 & 21-25, p. 9 lines 1-6, p. 14 lines 6-19). Since the end effector of Susil ('015) is moved by a computerized means, it is considered to move at a predetermined speed as claimed in the instant application. Furthermore, Susil ('015) teaches that the method and system may be used for a variety of biopsy and/or therapeutic procedures (p. 14 line 24 – p. 15 line 5). The system provided by Susil ('015) additionally includes computers for generating, displaying and registering the image data (Figs. 1 & 2).

Susil ('015) does not expressly teach computation of first and second trajectories based on the image space coordinate system and robot coordinate system, respectively, wherein the trajectories are translated between the two spaces via a transformation matrix. Susil ('015) does generally teach means and steps for transforming information from the image space to the robot space, which constitutes computation of two trajectories, one in each of the spaces, as claimed (p. 10 lines 1-17). Using matrices for coordinate space transformation is very well known in the art of robotics, as exemplified by Wang (col. 6 lines 7-43). It would have been obvious to one of ordinary skill in the art at the time of invention to use the matrix transformation steps and means of Wang ('429) with the method and system of Susil ('015) in order to establish a functional relationship between the image space and robot space, as such a modification would require nothing more than the mere combination of known prior art elements to yield predictable results, which has previously been held as unpatentable (see for precedent *KSR International Co. v. Teleflex Inc.*, 82 USPQ2d 1385).

Susil ('015) additionally lacks means and steps for monitoring a respiratory state of the subject over time. In the same field of endeavor of CT-guided biopsy, Onik ('538) teaches means and steps for monitoring the patient's respiratory phase for ensuring that the biopsy steps are performed during the same phase of respiration (col. 2 lines 20-22, col. 6 lines 43-46). Onik ('538) states that the movement of

Art Unit: 3737

the instrument should be gated based upon the patient's respiratory phase via a gating device, which is considered to be an implicit teaching of means and steps for stopping movement of the instrument when the patient is not in the predetermined respiratory phase (col. 9 lines 15-27). Onik ('538) additionally teaches respiratory phase monitoring is effective to enhance precision of surgical localization in the abdominal cavity while the patient is experiencing respiratory motion (col. 1 line 65 – col. 2 line 8). The means and steps for determining whether or not the patient is in a particular respiratory phase as taught by Onik ('538) constitutes determining whether the patient's monitored respiratory state is between a predetermined amplitude range having upper and lower thresholds, and it also constitutes the generation of a signal indicative of the respiratory state over time as is presently claimed.

It would have been obvious to one of ordinary skill in the art at the time of invention to modify Susil ('015), as modified by Wang ('429) to further include the respiratory monitoring means and steps of Onik ('538), in view of the teachings of Onik ('538).

Regarding claims 16-17, 19 and 20, the computerized system of Susil ('015), Wang ('429) and Onik ('538) must inherently include code for executing the steps as previously discussed for claims 1, 6 and 15, as it would not otherwise be operable.

Regarding claims 22 and 23, Onik ('538) teaches generating a gating signal in response to the patient's respiratory phase and subsequently moving the end effector in response to the gating signal (col. 2 lines 20-22). Moving the end effector inherently involves a plurality of steps, including at least the steps of transmission of a signal from the gating device to the robot, and subsequent movement of the end effector in response to such signal, in order for the reference invention to be operable.

6. Claims 6-12, 14 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Susil ('015) in view of Wang ('429), further in view of Onik ('538), further in view of Fore (US Patent No. 4,838,279), hereinafter Fore ('279) .

Regarding claims 6-8, Onik ('538), Wang ('429) and Susil ('015) substantially teach all features of the present invention as previously discussed for claim 1. Wang ('429) further teaches transformation between image and robot space using first, second and third transformation matrices for the image, end effector and robot spaces, respectively (col. 6 lines 7-43). Neither Onik ('538), Wang ('429), nor Susil ('015) expressly teach the respiratory monitoring device to be of the infrared variety. Fore ('279) teaches an infrared monitoring system configured to monitor respiratory motion (Abstract). Applicant has not

Art Unit: 3737

disclosed that the use of an infrared respiratory monitor solves a particular problem, serves a specific purpose, or provides a patentable advantage over any other respiratory monitor known in the art. It would have been obvious to one of ordinary skill in the art at the time of invention to have modified the combined system of Susil ('015), Wang ('429), and Onik ('538) to instead substitute the infrared respiratory monitor of Fore ('279), as such a modification would require nothing more than the mere combination of known prior art elements to yield predictable results, which has previously been held as obvious and unpatentable (see for precedent *KSR International Co. v. Teleflex Inc.*, 82 USPQ2d 1385).

Regarding claims 9-11, Susil ('015) provides a driver configured to linearly move the end effector, a positioning device for positioning the end effector, and an insertion device for orienting the end effector along the trajectory path (p. 9 lines 23-29).

Regarding claim 12, state of the art CT systems are known to include computerized means of positioning the patient to obtain a series of axial image slices during scanning.

Regarding claim 14, since the end effector of Susil ('015) is moved by computerized means, it is considered to move at a predetermined speed as claimed in the instant application.

Regarding claim 15, the computerized system of Susil ('015), Onik ('538), Wang ('429) and Fore ('279) must inherently include code for operating the system as previously discussed for claim 6, as it would not otherwise be operable.

Response to Arguments

7. Applicant's arguments filed 9 September 2008 have been fully considered but they are not persuasive. Regarding Applicant's arguments that the cited prior art does not teach means, steps or code for moving the end effector along the second trajectory path when the amplitude of the first signal is within the predetermined amplitude range, Examiner respectfully directs Applicant's attention to the previously cited respiratory gating of Onik ('538), as applied in the Final Office Action, wherein the respiratory phase signal and gate constitute the claimed predetermined amplitude range and upper and lower thresholds. By definition of the term "gating", gating as taught by Onik ('538) would inherently mean starting and stopping movement of the end effector based the thresholds.

Art Unit: 3737

8. Applicant's arguments alleging that the prior art does not teach the presently recited first, second and third transformation matrices are moot in view of the new grounds of rejection.

9. Applicant has not responded to the previous objection to claim 11. As such, the objection is maintained and reiterated herein.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to PARIKHA S. MEHTA whose telephone number is (571)272-3248. The examiner can normally be reached on M-F, 8 - 4:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Brian Casler can be reached on 571.272.4956. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Ruth S. Smith/

Primary Examiner, Art Unit 3737

/Parikha S Mehta/

Examiner, Art Unit 3737